1.0 Bluewater, New Mexico, Disposal Site

1.1 Compliance Summary

The Bluewater, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II Disposal Site was inspected on August 29, 2007, and was in excellent condition. Overall, the disposal cells and their cover materials are in excellent condition; however, several shallow depressions exist on the cover along the north edge of the main tailings disposal cell, and they will be surveyed in 2008 to determine if repairs are necessary. Maintenance work conducted at the site in 2007 included repair of the asbestos disposal cell cover, repairs to eroded sections of the site perimeter road, removal of windblown sand from the fences at the site entrance, and fence repairs. These repairs were in good condition at the time of the 2007 inspection. Groundwater monitoring results indicate that all compliance requirements continue to be met. No cause for a follow-up inspection was identified.

1.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Bluewater, New Mexico, Disposal Site are specified in the *Long-Term Surveillance Plan* [LTSP] *for the DOE Bluewater (UMTRCA Title II) Disposal Site Near Grants, New Mexico* (U.S. Department of Energy [DOE], Grand Junction, Colorado, July 1997) and in procedures established by DOE to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28). Table 1–1 lists license requirements for this site.

Table 1–1. License Requirements for the Bluewater, New Mexico, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Sections 3.3 and 3.4	Section 1.3.1
Follow-up Inspections	Section 3.5	Section 1.3.2
Routine Maintenance and Emergency Measures	Section 3.6	Section 1.3.3
Environmental Monitoring	Section 3.7	Section 1.3.4

Institutional Controls—The 3,300-acre disposal site is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission general license (10 CFR 40.28) in 1997. DOE is the licensee and, in accordance with the requirements for UMTRCA Title II sites, is responsible for the custody and long-term care of the site. Institutional controls at the disposal site, as defined by DOE Policy 454.1, consist of federal ownership of the property, a site perimeter fence, warning/no trespassing signs placed along the perimeter fence and around the disposal cells, and a locked gate at the site entrance. Verification of these institutional controls is part of the annual inspection. No off-site institutional controls are needed because contaminated groundwater is limited to the area within the federal land boundary.

1.3 Compliance Review

1.3.1 Annual Inspection and Report

The disposal site, located approximately 9 miles northwest of Grants, New Mexico, and 1.5 miles northeast of Bluewater, New Mexico, was inspected on August 29, 2007. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report

are shown on Figures 1–1 (south area) and 1–2 (north area). Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

1.3.1.1 Specific Site Surveillance Features

Entrance Gate, Access Road, Site Access Gate, and Signs—Access to the site is directly off of Cibola County Road 334; no private property is crossed to gain site access. The entrance gate (at County Road 334) is a steel, double-swing stock gate. The gate is secured by a chain and locks belonging to DOE and the various utility companies that have rights-of-way across the site. The access road leads from the entrance gate to the main site access gate that also is a steel, double-swing stock gate secured by locks. The access road is an all-weather road surfaced with crushed basalt and extends northward along a narrow strip of DOE property for approximately 1,700 feet from the entrance gate to the main site access gate. The entrance gate, access road, and access gate were all in good condition. Windblown sand tends to accumulate near the entrance gate and
1A had buried the boundary monuments and portions of the perimeter fence. The sand was moved away from these locations a week prior to the inspection (PL–1).

Fifty-five warning signs, designated as perimeter signs P1 through P52 on the drawings (including perimeter signs P2A, P9A, and P9B), are mounted on steel posts at access points along right-of-way intersections within the site boundary and around the main and carbonate
1B tailings disposal cells. Perimeter sign P1, located at the site entrance, was missing from the entrance gate and a new sign was installed on a metal t-post inside the gate (PL–2). Perimeter sign P3, damaged by a shotgun blast, is still legible. All other signs were in good condition.

Site Marker and Boundary Monuments—A granite site marker is located between the southwest corner of the main tailings disposal cell and the northwest corner of the carbonate tailings disposal cell. The marker was in excellent condition.

Twenty-four boundary monuments define the site boundary. These monuments are typically inside the perimeter fence and several feet inside the true corner or boundary line. Due to time constraints, not all of the boundary monuments were verified during the inspection; however, all of the monuments were located during a site maintenance visit in fall 2005. Some monuments tend to get covered by drifting sand, and metal t-posts have been driven at those locations to help locate them during future inspections.

Monitor Wells—The groundwater monitoring network consists of nine wells located inside the site boundary. Five wells are screened in the alluvial aquifer and the other four wells are screened in the San Andres Limestone-Glorieta Sandstone, which is the bedrock aquifer of concern at the site. The well surface casings and locked caps were in good condition.

1.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as transects: (1) the main tailings disposal cell, including the acid tailings disposal area and the south bench; (2) the carbonate tailings disposal cell, including the asbestos disposal area, the PCB (polychlorinated biphenyl) disposal area, and associated landfills; (3) the region between the disposal structures and the site perimeter; and (4) the site perimeter and outlying area.

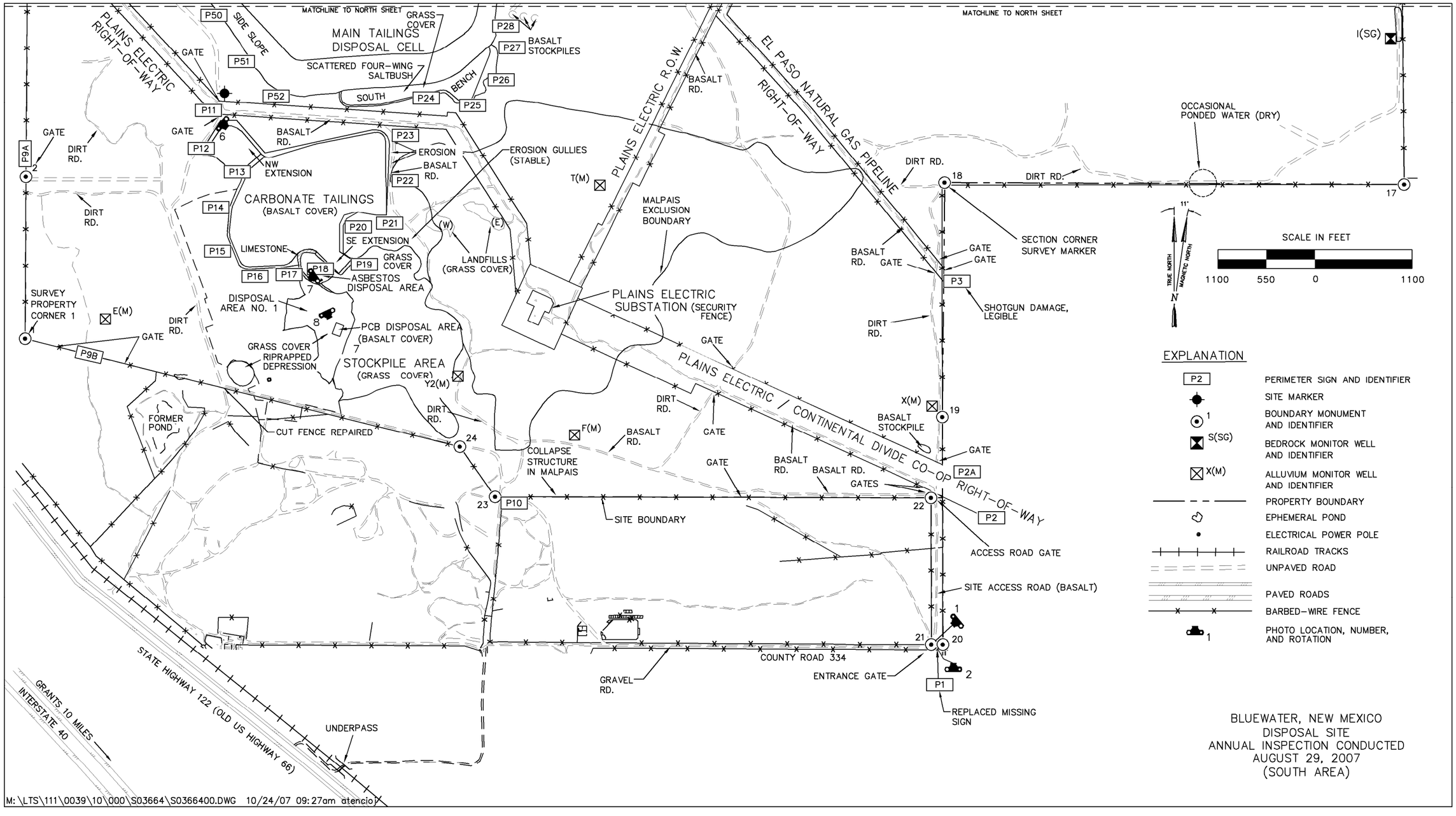

Figure 1–1. 2007 Annual Compliance Drawing for the Bluewater, New Mexico, Disposal Site (South Area)

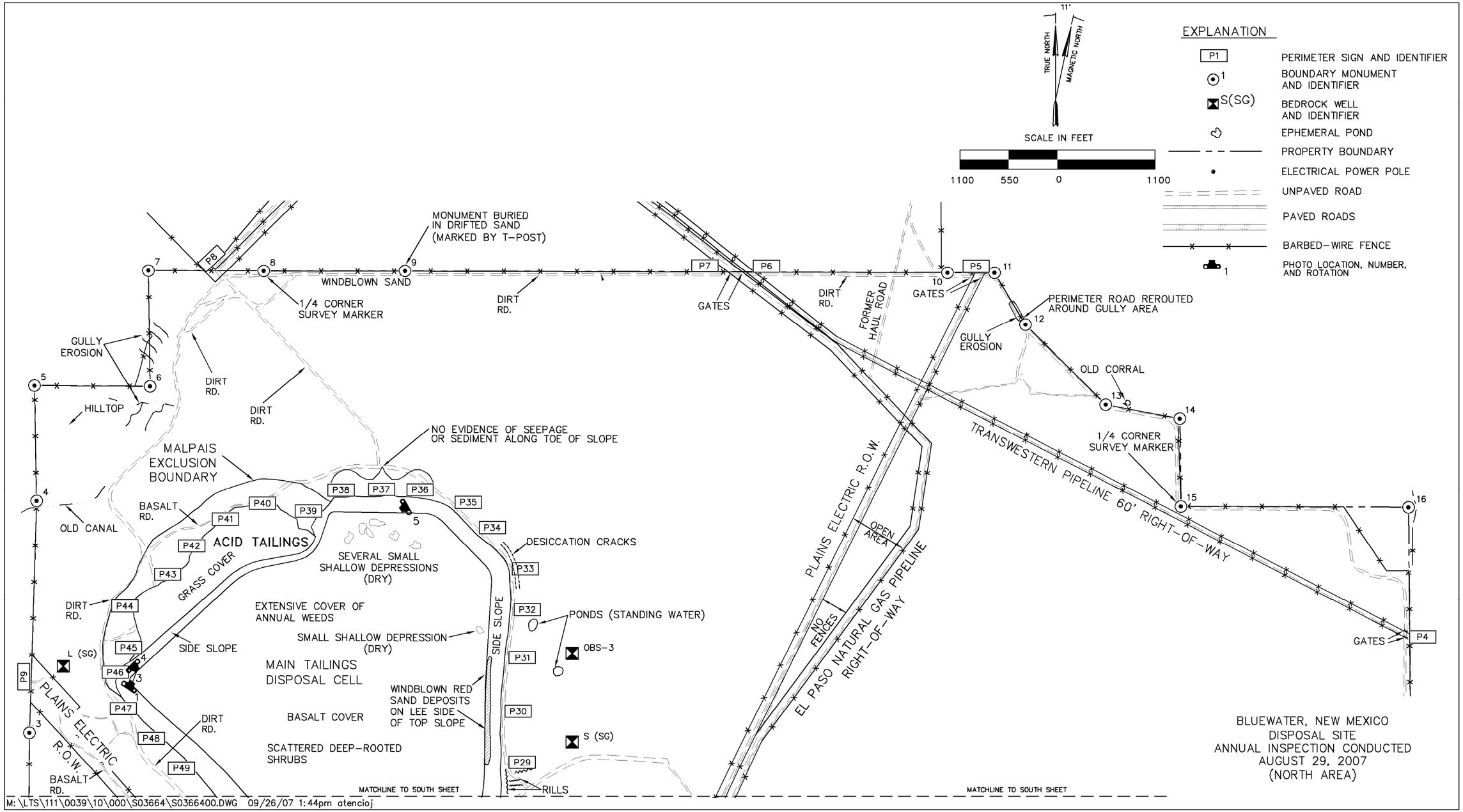

Figure 1–2. 2007 Annual Compliance Drawing for the Bluewater, New Mexico, Disposal Site (North Area)

Within each transect, inspectors examined specific site surveillance features, such as monitor wells, boundary monuments, and signs. Inspectors examined each transect for evidence of erosion, settling, slumping, or other disturbance that might affect site integrity, protectiveness, or the long-term performance of the site.

Main Tailings Disposal Cell, the Acid Tailings Disposal Area, and the South Bench Disposal Area—These three disposal areas are contiguous and together constitute one large disposal area of approximately 320 acres; all were in excellent condition. The main tailings disposal cell is covered with basalt riprap and slopes northward. The top slope grade decreases from 3 to 4 percent at the south end to less than 0.5 percent at the north end. The top slopes of the acid tailings (PL–3) and the south bench disposal areas are essentially flat and covered by healthy grass. The side slopes of the three disposal areas are protected by basalt riprap. The riprap was in excellent condition.

As shown on photo PL–4, the top of the main tailings disposal cell had an extensive cover of annual weeds (primarily Russian thistle, which is not a listed noxious weed in New Mexico), along with some wildflowers and deep-rooted shrubs (rabbitbrush and four-wing saltbush). Patches of annual weeds also were present on the east side slope of the cell. Control of plant encroachment is not required by the LTSP.

Several small shallow depressions exist on the relatively flat north end of the top slope of the main tailings disposal cell (PL–5). Although ponded water has been observed in the past, the depressions have been dry during the last several inspections. Given that evaporation greatly exceeds precipitation in this area, ponding is believed to be infrequent and brief and, therefore, is not considered to be a concern at this time. Slimes from the settling ponds were placed in the northern part of the main tailings disposal cell, and areas containing slimes are more likely to settle than areas containing drier waste materials. The depressions will continue to be monitored for evidence of significant settling or displacement. A survey of the affected area is planned for 2008 to compare the current surface configuration with the design drawings, and the results will be evaluated to determine if repairs to the cover should be considered.

Desiccation cracks are present in the soil adjacent to the northeast corner of the main tailings disposal cell. The features are caused by shrinkage of clay-rich backfill materials and do not impact the stability of the cell. Small ponds often form in an area along the east side of the disposal cell and in other low spots following storm events and provide water for wildlife and wild burros that inhabit or travel through the site. The areas of ponding are far enough from the cell to not impact it.

Carbonate Tailings Disposal Cell, Asbestos and PCB Disposal Areas, and Landfills—The top and side slopes of the carbonate tailings disposal cell are covered by basalt riprap. The top, for the most part, slopes gently eastward. The small northwest and southeast extensions slope in their respective directions. Annual weeds and scattered woody shrubs were present on the cell and its extensions (PL–6). The carbonate tailings disposal cell was in excellent condition.

The asbestos disposal area is a bowl-like feature just south of the carbonate pile. The north, west, and south side slopes of this feature are covered by limestone riprap; the bottom of the bowl (the asbestos cell cover) is grass covered. A small depression was located along the south edge of the disposal area. The depression, probably the result of piping or collapse of uncontaminated fill material incompletely compacted during final grading, was first noted during the 1999 annual

inspection but had not been a concern because it does not encroach on asbestos-containing materials. However, to mitigate the potential for encroachment into these materials, the
1C depression was filled with crushed basalt rock during spring 2007. No additional settling had occurred since the repair was completed (PL–7). The asbestos disposal area is in excellent condition.

The small riprap-covered PCB disposal area is in excellent condition (PL–8). The two grass-covered landfill areas east of the carbonate tailings disposal cell also are in excellent condition. Two other disposal areas, Disposal Area Number 1 and the Stockpile Area, are south of the carbonate tailings disposal cell. Both are grass-covered and in excellent condition.

Area Between the Disposal Cells and the Site Perimeter—Other areas inside the site were inspected by driving the site perimeter road and other roads and tracks. Much of the southern and western parts of the site are inaccessible by vehicle because they are covered by basalt flows.

Several utility company rights-of-way cross the site. These rights-of-way are enclosed by stock fences with gates where the rights-of-way intersect one another, cross the site boundary, or cross the perimeter road. Roads along the rights-of-way typically are covered with crushed basalt to provide the utility companies with all-weather access.

Stockpiles of basalt riprap that can be used by DOE for road repairs are in two areas. One stockpile is located north of the access road gate; rock from this pile was used to repair the asbestos cell cover and the perimeter road in 2007. A cluster of three stockpiles is located east of the main tailings disposal cell.

An electric power substation is enclosed by a security fence near the center of the site along the Plains Electric Company right-of-way. Fencing around this station was in good condition.

The vegetation was in good health in several areas of the site. However, due to runoff and wind erosion, a portion of the site northeast of the main tailings disposal cell remains relatively barren. Reuse of the site through controlled grazing of the vegetated areas of the site was considered by DOE. However, the discontinuity of the vegetated areas and the lack of water for livestock made this use unfeasible.

Site Perimeter and Outlying Areas—A local subcontractor has been retained to repair the
1D fencing and periodically check for unauthorized livestock use or trespassing on site property. Grazing is not part of the current management plan for this site and, if livestock are discovered on the site, the subcontractor is authorized to remove the animals. The subcontractor repaired cut fences and replaced a short section of fence in 2007.

The perimeter road consists of a dirt track covered at places with crushed basalt. The road runs along the site boundary in much of the southern and most of the northern and eastern parts of the site. Portions of the road are susceptible to erosion, and large gullies had formed in several areas after record rainfall events in 2006. These sections were repaired during spring 2007 and,
1E overall, were in good condition at the time of the inspection despite several significant rainfall events that had occurred since the repairs were completed.

Surrounding land is used for livestock grazing and wildlife habitat. The area outside the site boundary for 0.25 mile was visually inspected for erosion, development, change in land use, or other phenomena that might affect the long-term integrity of the site. None was seen.

1.3.2 Follow-up Inspections

DOE will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition, or (2) DOE is notified by a citizen or outside agency that conditions at the site are substantially changed. No follow-up inspections were required in 2007.

1.3.3 Routine Maintenance and Emergency Measures

During 2007, the asbestos cell cover, perimeter fence, and the perimeter roads were repaired. Also, windblown sand was removed from the fence near the site entrance gate. The site was checked on a monthly basis by a local subcontractor for evidence of trespassing and to ensure that the perimeter fence is intact.

Emergency measures are corrective actions that DOE will take in response to unusual damage or disruption that threaten or compromise site health and safety, security, integrity, or compliance with 40 CFR 192. No emergency measures were required in 2007.

1.3.4 Environmental Monitoring

1F Groundwater monitoring is required at the Bluewater site. In accordance with the LTSP, the alluvial aquifer background and point-of-compliance (POC) wells are sampled annually for polychlorinated biphenyls (PCBs) and every 3 years for molybdenum, selenium, and uranium (Table 1–2). The bedrock aquifer background and POC wells are sampled every 3 years for selenium and uranium. Alluvial aquifer well MW–X(M) and bedrock aquifer well MW–I(SG), point-of-exposure (POE) wells located along the east (downgradient) property boundary, will be sampled only if specified alternate concentration limits (ACLs) are exceeded at the respective alluvial and bedrock aquifer POC wells (Table 1–3). To date, sampling of the POE wells has not been required because ACLs have not been exceeded at the POC wells.

Only PCBs were sampled for during the November 2006 sampling event. PCBs have never been detected in any of the wells at the site and were not detected during that event. The next 3-year sampling event for all of the parameters is scheduled for November 2007, and the results will be included in the 2008 annual compliance report.

Table 1–2. Groundwater Monitoring Network for the Bluewater, New Mexico, Disposal Site

Monitor Well	Network Application	Analytes	Frequency
MW–E(M)	Alluvial background well	Mo, Se, U, and PCBs	Every 3 years (PCBs annually)
MW–F(M)	Alluvial POC well	Mo, Se, U, and PCBs	Every 3 years (PCBs annually)
MW–T(M)	Alluvial POC well	Mo, Se, U, and PCBs	Every 3 years (PCBs annually)
MW–Y2(M)	Alluvial POC well	PCBs	Annually
MW–X(M)	Alluvial POE well	Mo, Se, U, and PCBs	If alluvial POC ACL exceeded
MW–L(SG)	Bedrock background well	Se and U	Every 3 years
MW–OBS-3	Bedrock POC well	Se and U	Every 3 years
MW–S(SG)	Bedrock POC well	Se and U	Every 3 years
MW–I(SG)	Bedrock POE well	Se and U	If bedrock POC ACL exceeded

Key: ACL = alternate concentration limit; Mo = molybdenum; PCB = polychlorinated biphenyl; POC = point-of-compliance; POE = point-of-exposure; Se = selenium; U = uranium

Table 1–3. Groundwater Alternate Concentration Limits for the Bluewater, New Mexico, Disposal Site

POC Well	Analyte	ACL (mg/L)
Alluvium MW–F(M) and MW–T(M)	Molybdenum Selenium Uranium	0.10 0.05 0.44
Bedrock MW–OBS-3 and MW–S(SG)	Selenium Uranium	0.05 2.15

Key: ACL = alternate concentration limit; mg/L = milligrams per liter; POC = point-of-compliance

1.3.5 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL–1	230	Windblown sand removed from the west fence near boundary monument BM–21 at the site entrance.
PL–2	0	New perimeter sign P1 located inside the entrance gate.
PL–3	35	The grass-covered acid tailings disposal cell.
PL–4	135	The southwest edge of the main tailings disposal cell cover.
PL–5	240	Depressions along the north edge of the main tailings disposal cell.
PL–6	130	View across the northwest extension of the carbonate tailings disposal cell.
PL–7	235	Repaired depression in the asbestos disposal cell cover.
PL–8	155	The PCB disposal area cover.

BLU 8/2007. PL–1. Windblown sand removed from the west fence near boundary monument BM-21 t the site entrance.

BLU 8/2007. PL–2. New perimeter sign P1 located inside the entrance gate.

BLU 8/2007. PL–3. The grass-covered acid tailings disposal cell.

BLU 8/2007. PL–4. The southwest edge of the main tailings disposal cell cover.

BLU 8/2007. PL–5. Depressions along the north edge of the main tailings disposal cell.

BLU 8/2007. PL–6. View across the northwest extension of the carbonate tailings disposal cell.

BLU 8/2007. PL–7. Repaired depression in the asbestos disposal cell cover.

BLU 8/2007. PL–8. The PCB disposal area cover.